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EXAMINER

ZERVIGON, RUDY

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Please find below and/or attached an Office communication concerning this application or proceeding.

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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/674,569
Filing Date: September 29, 2003
Appellant(s): JANAKIRAMAN ET AL.

MAILED
OCT 03 2007
GROUP 1700

Kent J. Tobin
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed June 25, 2007 appealing from the Office action mailed October 4, 2006.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6454860	METZNER	9-2002
JP04154116A	TOKI	5-1992

(9) Grounds of Rejection

The following grounds of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 102

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by Metzner; Craig R. et al (US 6,454,860 B2).

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention “by another,” or by an appropriate showing under 37 CFR 1.131.

Metzner teaches a gas distribution face plate (240; Figure 4; column 7, lines 33-50) comprising: a face plate (240; Figure 4; column 7, lines 33-50) body having a thickness (distance 249; Figure 7) defining a number of inlet orifices (249; Figure 7; column 9, lines 53-64) having a width (247; Figure 7; column 9, lines 53-64) of between about 0.010” and 0.018” (column 9, line 38: “inlet diameter 247 of 0.028 inches”) and a depth (283, 249; Figure 7; column 9, lines 53-64), at least one parameter selected from the number, the width (247; Figure 7; column 9, lines 53-64), and

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the depth (283, 249; Figure 7; column 9, lines 53-64) configured to create a uniform pressure drop of between about 0.8 and 1 Torr across edge and center regions of the face plate (240; Figure 4; column 7, lines 33-50) as gas is flowed through the inlet orifices (249; Figure 7; column 9, lines 53-64), whereby a thickness of material deposited at an edge of a wafer varies by 3% or less from a thickness of material deposited at a center of the wafer, when the wafer is separated from the face plate (240; Figure 4; column 7, lines 33-50) by a gap of between about 75 and 450 mils, as claimed by claim 1. Applicant's claim limitations of "...configured to create a uniform pressure drop of between about 0.8 and 1 Torr across edge and center regions of the face plate (240; Figure 4; column 7, lines 33-50) as gas is flowed through the inlet orifices, whereby a thickness of material deposited at an edge of a wafer varies by 3% or less from a thickness of material deposited at a center of the wafer, when the wafer is separated from the face plate by a gap of between about 75 and 450 mils" are claim requirements of intended use. Further, it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter , 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. Additionally, it is believed the prior art apparatus is capable of performing the intended use. If the prior art structure is capable of performing the intended use, then it meets the claim (In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto , 136 USPQ 458, 459 (CCPA 1963); MPEP 2111.02). When the structure recited in the reference is substantially identical to that of the claims, claimed properties or functions are

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presumed to be inherent (In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977); MPEP 2112.01).

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1, and 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Toki, Masahiko et al. (JP 04154116 A). Toki Teaches a low pressure CVD apparatus (Figures 1,2) including a face plate body 21 (abstract, Figure 1) with a pressure drop across said face plate body 21 sufficient to provide “film thickness distribution is within 3%” (abstract).

Toki does not teach the wafer separation distance of 75 to 450 mills and the exact pressure drop of 0.8 and 1Torr range accords the face plate body 21. Toki further does not teach his face plate body 21 with the number of orifices (25,26; Figure 1) between 2000 and 17,500 orifices and where said orifices have widths between 0.010 and 0.018 inches as claimed by claims 2-5.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to optimize the dimensions and number of Toki’s inlet orifices to optimize the claimed film thickness variation resulting from the uniform pressure gradient.

Motivation to optimize the dimensions and number of Toki’s inlet orifices to optimize the claimed film thickness variation resulting from the uniform pressure gradient is for achieving film thickness uniformity as taught by Toki (abstract). Further, it is well established that changes in apparatus dimensions are within the level of ordinary skill in the art.(Gardner v. TEC Systems, Inc. , 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied , 469 U.S. 830, 225 USPQ 232 (1984); In re Rose , 220 F.2d 459, 105 USPQ 237 (CCPA 1955); In re Rinehart, 531

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F.2d 1048, 189 USPQ 143 (CCPA 1976); See MPEP 2144.04). Further, it is well established that the duplication of parts is obvious (In re Harza , 274 F.2d 669, 124 USPQ 378 (CCPA 1960) MPEP 2144.04).

(10) Response to Argument

As a preliminary note, the Examiner submitted to the STIC a formal request for translation of the JP04154116A patent to Toki. The certified translation by the STIC, if not completed by the mailing date of this office action, will be provided to Applicant upon completion.

With respect to the Metzner reference, and the Examiner's anticipation rejection based thereon, Applicant asserts:

“

There is absolutely no teaching or suggestion in the Metzner Patent, regarding use of inlet orifices of the widths recited by claim 1.

“

and specifically...

“

In the most recent office action, the Examiner asserted that the Metzner Patent disclosed the claimed range at col. 9 line 38 and at col. 9 lines 53-64. Careful review of the Metzner Patent, however, fails to reveal any disclosure of the claimed orifice widths, in the cited passages or anywhere else for that matter.

Specifically, at col. 9 line 38, the Metzner Patent describes attaching the shower head and blocker plate to the lid using fasteners. A col. 9, lines 53-64, the Metzner Patent generally introduces Figures 6 and 8. Neither passage teaches orifices having a particular width.

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The Examiner may have intended to refer to col. 10 of the Metzner Patent. For example, col. 10, line 38 recites an orifice having a width of 28mils, as does col. 10, line 56.

“

Strictly with respect to Applicant's cited portion in the Metzner Patent, Applicant is correct. The Examiner erred in citing the quoted portion in the Metzner Patent supporting his anticipation conclusion. The correct portion of the Metzner Patent which anticipates Applicant's claimed dimension is at (Column 10, lines 55-56). In response to Applicant's position regarding the Metzner reference not showing certain claimed features, the Examiner believes the claim 1 limitation of “a width of between about 0.010” and 0.018” is explicitly taught by Metzner as discussed above. Specifically, Metzner states that his width (247; Figure 7; column 9, lines 53-64; column 10; lines 55-56) of between about 0.010” and 0.018” is “about” in the range claimed. In this case “inlet diameter 247 of about 0.028 inches “ (*Column 10, lines 55-56*) has a difference with the claimed upper range of 0.028” – 0.018” of 0.01 inches which is described by Metzner with sufficient specificity.

Applicant further states:

“

The remainder of the Metzner Patent teaches orifices having an even greater width (110mil.) (See col. 11, line 5, and col. 12, line 15). Such a large orifice width can hardly be understood to suggest the much smaller range of orifice widths claimed by Applicants.

“

In response, the Examiner has already cited the specific example, as stated above, in the Metzner Patent which is believed to anticipate Applicant's claimed approximate range.

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The Examiner also wishes to emphasize that Applicant's claim limitations of "...configured to create a uniform pressure drop of between about 0.8 and 1 Torr across edge and center regions of the face plate as gas is flowed through the inlet orifices, whereby a thickness of material deposited at an edge of a wafer varies by 3% or less from a thickness of material deposited at a center of the wafer, when the wafer is separated from the face plate by a gap of between about 75 and 450 mils" are claim requirements of intended use. Specifically, Applicant's claimed "pressure drop of between about 0.8 and 1 Torr across edge and center regions of the face plate" is a function of many process variables including process gas flow rate, process operating temperature, and even the dimensions (height) of the wafer itself. Here, the wafer height, which is not considered part of the claimed structure of the apparatus, may arbitrarily be selected such that the claim limitation of "when the wafer is separated from the face plate by a gap of between about 75 and 450 mils" is met. It is believed the prior art apparatus is capable of performing the intended use. If the prior art structure is capable of performing the intended use, then it meets the claim (In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto, 136 USPQ 458, 459 (CCPA 1963); MPEP 2111.02). When the structure recited in the reference is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent (In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977); MPEP 2112.01).

With regard to the Toki reference, Applicant states:

"

...the Examiner openly concedes that the Toki Application fails to provide any teaching regarding many of the features of the claimed gas distribution shower head:

"

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In response, and as noted by the Examiner with respect to the Metzner Patent, *many* of the very limitations that both Applicant *and* the Examiner agree are considered intended use recitations. As in Metzner, the Toki patent has the very same structural components that perform identical functionals as the present application Applicant. Applicant's claimed "pressure drop of between about 0.8 and 1 Torr across edge and center regions of the face plate" is a function of many process variables including process gas flow rate, process operating temperature, and even the dimensions (height) of the wafer itself. Here, the wafer height, which is not considered part of the claimed structure of the apparatus, may arbitrarily be selected such that the claim limitation of "when the wafer is separated from the face plate by a gap of between about 75 and 450 mils" is met. It is believed the prior art apparatus, as described by the Toki patent, is capable of performing the intended use. If the prior art structure is capable of performing the intended use, then it meets the claim (In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto, 136 USPQ 458, 459 (CCPA 1963); MPEP 2111.02). When the structure recited in the reference is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent (In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977); MPEP 2112.01). Specifically, the sum total of *all* of the possible variables influencing Toki's outcome of providing "a thin film whose film thickness distribution is within 3%" demonstrates that although the claimed intended use features are not explicitly disclosed by Toki, Toki's apparatus is indeed capable of performing the intended use. Because of the direct analogs in apparatus parts between the Toki patent and Applicant's claimed invention, the Examiner believes that some, if not, all of applicant's intended use recitations are met. The Examiner thus believes that there exists strong grounds for maintaining his obviousness rejections of the claimed invention based on at least the

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skilled artisan's capacity to optimize the result-effective variables of process gas flow rate, process operating temperature, and even the dimensions (height) of the wafer itself.

Further, it is noted that in theory, wafer diameter, which is not considered a structural feature in apparatus claims, would directly influence the claimed "whereby a thickness of material deposited at an edge of a wafer varies by 3% or less from a thickness of material deposited at a center of the wafer". A variation of 3% in deposition height (thickness) of a wafer that is 1 meter (or even 1000m) in diameter is indeed a much more difficult outcome to achieve than would be a variation of 3% in deposition height (thickness) of a wafer that is 0.001 meter (or 1mm) in diameter. Based on this, both of the Examiner's references, and possibly all other references with similar structure and function, may indeed be capable of "a thickness of material deposited at an edge of a wafer varies by 3% or less from a thickness of material deposited at a center of the wafer" when the *size* of the wafer is appropriately chosen.

Applicant's illustration of unexpected results "Figure 16", page 7 of the Brief, is fully considered but is not persuasive. Further, and most importantly, Applicant's Figure 16 is absent error bars that would illustrate variance among measurements and may provide ranges of data that are taught by the prior art.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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